THE DEVELOPMENT AND USE OF RAPID INTERVENTION TEAMS FOR THE CHELMSFORD, MA. FIRE DEPARTMENT

Executive Leadership Course

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ABSTRACT

The establishment of Rapid Intervention Teams (RIT) as a fire department standard has become a very important issue for the Chelmsford Fire Department. Massachusetts is not an OSHA state and therefore is not mandated to implement OSHA's Respiratory Protection Standard, CFR 1910.134, which includes the two in/two out section of the standard.

The problem that prompted this research project is that the Chelmsford Fire Department does not assign personnel for the sole purpose of rescuing fire fighters working at emergency incidents. The purpose of this research project is to develop a policy to assign personnel during emergency incidents for the sole purpose of rescuing fire fighters working at emergency incidents. In addition, this research will enable the author to develop a standard operating procedure and an equipment list for the operation of a RIT.

The following five research questions were posed:

1. What is required in NFPA 1500 concerning rapid intervention for rescue of department members?
2. Is there a real need for RITs?
3. How can RITs be integrated into the Chelmsford Fire Department?
4. What changes will need to be made in the current response system's running cards?
5. Will there be an additional dollar cost to the department for the implementation of a RIT?

In conducting this research, historical research supported action research. Historical research was utilized by thoroughly reviewing historical literature directly related to the subject matter. Action research was also employed because the information collected was used to develop a RIT S.O.P. and a RIT equipment list. All literature was current and in all cases the literature was written after January 1997. A majority of the articles were taken from trades magazines such as *Firehouse*, *Fire Engineering*, and *Fire Chief*. *NFPA 1500 Standard of Fire Department Occupational Safety and Health Program*, and OSHA's Respiratory Protection Standard, 29 CFD 1910.134 was also consulted. The gathering of this information proved to be very valuable in the research.

Research began with a thorough review of all the literature collected. This was done to help make the author more knowledgeable about the subject. After a thorough review of the literature, a SOP for the use of RITs on the fireground and an equipment list was developed. A checklist was also adopted to aid the team in set up and operations.

RITs can be integrated into the Chelmsford Fire Department by adopting the standards set forth in NFPA 1500. Training of the entire department will be conducted to ensure that RIT members are capable of performing the required functions expected of the team. In addition, training will be conducted to ensure that all policies pertaining to the use of RIT is fully understood by all department members. The RIT concept will need to be reviewed from time to time to ensure effectiveness and compliance.

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INTRODUCTION

The establishment of Rapid Intervention Teams (RIT) as a fire department standard have become a very important issue in Eastern Massachusetts and more directly the Chelmsford Fire Department. Massachusetts is not an OSHA state and therefore the mandated implementation of OSHA's Respiratory Protection Standard, CFR 1910.134 and the two in/two out section of the standard is not benefiting the fire departments in this state.

The problem that prompted this research project is that the Chelmsford Fire Department does not assign personnel for the sole purpose of rescuing fire fighters working at emergency incidents.

The purpose of this research project is to develop a policy to assign personnel during emergency incidents for the sole purpose of rescuing fire fighters working at emergency incidents. In addition, this research will enable the author to develop a standard operating procedure and a tool list for the operation of a RIT.

In conducting this research, historical research supported action research. Historical research was utilized by thoroughly reviewing historical literature directly related to the subject matter. Action research was also employed because the information collected was used to develop a RIT S.O.P. and a RIT equipment list. The following five research questions were posed:

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5. Will there be an additional dollar cost to the department for the implementation of a RIT?

BACKGROUND AND SIGNIFICANCE

The Chelmsford Fire Department is a fully paid department consisting of 60 uniformed employees that operate out of five stations. Firefighters work a 42 hours per week schedule and are divided into four groups. In calender year 1998 the department answered just over 4,500 emergency calls. On a normal shift they operate five (5) engines, one (1) ladder and one (1) heavy rescue. The operating budget of the department is 3.9 million dollars.

The department adopted and put into use an incident command system (I.C.S.) and accountability system during the summer of 1998. The I.C.S. has given the department a standardized system for effectively managing emergency incidents and the accountability system has allowed for the I.C. to know who is operating on the fireground and where. After fine tuning both these systems over the past year the department members have realized the benefits of having these systems in place both for fireground management and

the overall safety of its members. However, the success of these two systems have brought to light a deficiency that we have in the ability to rescue a fire fighter(s) in trouble.

This research project is significant to the Chelmsford Fire Department because it will improve fireground and emergency scene operations and provide a level of safety for the fire fighters that is not currently available. This paper is also relevant to the E.F.O. course Executive Leadership Course, Unit 6, Fostering Creativity and Innovation and Unit 11, Managing Change.

LITERATURE REVIEW

The Need for Rapid Intervention Teams

Fire fighter deaths have dropped over the past twenty years, from a high of 140 deaths in the 1970's to less than 100 in the 1990's (Norman, July 1997). Although the total numbers of deaths are down, a new trend may be emerging regarding fireground deaths. Fire fighters are dying from smoke inhalation and exposure to fire because they are becoming lost and trapped in fire buildings (Norman, July 1997).

Fire fighters, through the nature of the profession, will continue to find themselves in life threatening situations, trapped, cut off by extending fire, lost, and overcome by heat and smoke. Fire fighters are exposed to the greatest risk of death or injury while operating at an emergency scene (Murgallis, 1998). According to Robert Cobb, fire fighters are being injured and killed during the initial stages of a fire. Contributing factors to this phenomenon are, lightweight wood-truss construction, energy efficient windows, older buildings and lack of survival training (1998).

Trapped, overcome or lost fire fighters will die if they are not located and quickly rescued. A limited air supply and the hostile environment they are operating in will assure this outcome (Crawford, 1999). Trying to gather together a rescue team after a collapse or when a fire fighter is reported missing, is ineffective and time consuming. To deal with these conditions fire fighters need to be available to go into a fire situation and rescue other fire fighters in distress. A three to ten minute response may not be of any help, when most responses of this nature are needed in seconds (Eisner 1997). NFPA 1500 and the OSHA Respiratory Protection Standard, 29 CFR 1910.134, refer to the fire fighters ready to perform a rescue as Rapid Intervention Teams (RIT) or Crews (RIC) (Norman, Sept. 1997). RITs operate with a very simple concept. They are the first responders used to rescue lost or trapped fire fighters (Cobb, 1998). They usually consist of at least two fire fighters who enter a fire building and rescue trapped fire fighters (Norman, Sept. 1997). RITs must be properly equipped and ready to deploy on a moments notice. To be successful, a RIT must train in rescue and search techniques until they become second nature to them (Crawford, 1999).

According to Hal Bruno, OSHA's new rule dealing with two in/ two out is a direct result of fire fighters being killed in a fire building because a rescue team was not standing by and available when they needed help (1998). Alfred K. Whitehead, President of the IAFF, hails the rule as "the most significant advance in fire fighter safety in a decade ... it will save fire fighters' lives this year and for many years to come." (Bruno, 1998,10).

Steps Fire Fighters Can Take to Reduce Death and Injury on the Fireground

Captain John Norman, with the FDNY, suggest that three steps can be taken to

reduce fire fighter deaths and injuries:

> "1. Improve hazard awareness.
> 2. Provide emergency escape or self rescue ability.
> 3. Provide rescue capability: rapid intervention teams" (Norman July 1998,18).

Fire fighters need to be aware of the dangers they face at a fire scene. They must be able to recognize the dangers that confront them and the action necessary to protect themselves. When arriving on a fire scene, a fire fighter should determine the answers to the following questions:

What is the occupancy? Certain occupancies present certain dangers, i.e., hazardous chemicals. Anticipated hazards in an occupancy should dictate the importance or non importance of an aggressive interior attack (Norman, July 1998). Where are the occupants? The greatest loss of life occurs in one and two family homes. The level of fire attack for this type of dwelling should not be the same as that of a mercantile building. Where is the fire? Basements, attics and windowless building create a different hazard than that of a typical bedroom fire. How do we get in? A fire fighter needs to size-up the building to determine the best way to make entry and attack the fire. How do we get out? Most fire fighters become disoriented before they become lost or trapped. During the building size-up, a fire fighter must make a mental note of windows and other means of egress. Always have an escape plan in the back of your mind. What is happening to the building? Conditions within the building need to be monitored on a continual basis. The potential of backdraft or flashover must be observed. A fire fighter will need to be aware of the effect the fire is having on the building and whether the fire attack being conducted is

making headway on the fire or not (Norman, July 1998).

The knowledge and ability to extricate yourself from a fire building is another important survival skill. When a fire fighter becomes lost or cut off by an extending fire, they first need to find an area of safe refuge. They then need to notify someone on the fireground that they are in trouble. This can be done either over a portable radio, activating a PASS devise or by yelling for help. If these efforts prove futile, removing yourself from danger will become necessary. Escape through a door or a window, preferably over a ladder, may allow a fire fighter to get to a safer place (Norman, July 1998).

Rapid Intervention Team Make Up and Requirements

The five essentials to a successful RIT operation are: people, policies, training, and tools (Norman, Sept. 1998). People are the most important resource which must be pre assigned and made available at every working fire. They should report to the I.C. in full protective gear and ready to go to work. Always realizing that the first twenty minutes of a structure fire usually prove to be the most dangerous for those on the fireground (Crawford, 1998).

Policies should outline the importance of the RIT, duties, tools, and the automatic assignment of the team on all working fires (Norman, Sept. 1998). It is important to have written procedures and guidelines to outline the responsibilities and use of RITs. If mutual aid is used by your community, those mutual aid agencies should be familiar with the manner in which your RIT operates (Murgallis, 1998).

Training regarding building size-up, the rescue of trapped fire fighters and the proper use of rescue tools is essential to the success of the team. Many fire departments

are issuing SOPs for RITs but are failing to properly train their personnel. Training in this area is essential to the success of the RIT concept (Lasky, 1997).

The establishment of a required tool list is also very important. The list will help to ensure tool familiarization, proper use and the certainty that these tools will be assessable and available before a crisis situation arises (Norman, Sept. 1998). RITs need to train with the tools assigned to them along with the various search techniques, extrication procedures and fire fighter removal methods. New technology should always be explored and added to the team arsenal when found to be of value, an example of this would be the thermal imaging camera (Crawford, 1998).

Operation of the Rapid Intervention Teams on the Fireground

A fire chief is responsible to manage the fireground and to provide for the safety of all the fire fighters on a scene. RITs should be dispatched to all working structure fires (Crawford, 1999). By establishing a RIT in the initial stages of a fire, the chief can react to one of the worst fireground emergencies, a trapped or lost fire fighter (Dunn, 1998). When resources are available, many fire departments include RITs into their running cards or assign a specific company the RIT duty when responding to an alarm, i.e., third engine in is the RIT (Murgallis, 1998).

RITs are deployed on the fireground for many reasons, to find disoriented fire fighters, to rescue fire fighters caught in building collapses, flashovers, backdrafts or rapid increases in fire intensity. Team members must monitor the fireground for calls for assistance. A team could be put into action if an accountability check shows that a fire fighter is missing (Crawford, 1999). RITs can also contribute to the safety on the fireground

by providing a second set of eyes to the I.C. (Cobb, 1998). Most fire department operating guides require the RIT to conduct a size-up upon arrival. Additionally, they can act as a second set of ears while monitoring radio communications on the fireground (Cobb, 1998).

During the early stages of a fire the RIT can perform short term functions, such as securing utilities, flaking out hose or working at the command post. However, as the incident escalates, these fire fighters need to become solely dedicated to the RIT (Murgallis, 1998).

Duties and Responsibilities of the Rapid Intervention Team

The RIT will need to conduct its own size-up of the fire building including, type of building, type of construction, occupancy, fire location, extent of fire damage and the progress of the current fire attack operations (Norman, Nov. 1997). A tool stagging area should be established by first laying a tarpaulin on the ground for tool placement (Crawford, 1998). This will also establish an anchor point for the RIT.

The team should place a ground or aerial ladder at the front of the building to the upper floor if one is already not in place. This will act as a second means of escape for crews working inside the building. It is important at this point that the RIT does not get involved in fire fighting activities and fully understands the importance of their assignment (Crawford, 1998). The team should remain in contact with the I.C. at all times, monitor radio transmissions for “mayday” calls and assess the progress of the fire attack (Crawford, 1998).

Rescuing a fire fighter is very different from rescuing a civilian. Fire fighters are all full grown adults, and have additional complications associated with turnout gear and

SCBA. Furthermore, a level of anxiety is to be expected when rescuing “one of our own” (Norman, Nov. 1997).

When the report of a trapped or missing fire fighter is received by the I.C. a variety of command considerations need to be reviewed. The I.C. needs to request additional alarms and/or personnel to assist with the rescue and fire fighting operations. It is important that the I.C. establishes a clear chain of command with the RIT. This is best done by designating a fire fighter as a rescue officer, to oversee the RIT operations (Norman, Nov. 1997). This Officer should be assigned to the Command Post. In addition, a private radio channel needs be assigned to the rescue operation. A charged hoseline should also be brought to the rescue area and an attempt to aggressively ventilate the rescue route and area should be undertaken (Crawford, 1998).

A back-up RIT will need to be established to protect those still working on the fire scene and to assist the first RIT if needed. In addition, it is good command practice to conduct an accountability check of those working on the fireground each time a RIT is deployed. Depending on the nature of the rescue the I.C. should consider activating the CISD team. Training is the key to successful rapid intervention team operations and should not be overlooked (Crawford, 1998).

When a RIT is deployed several tasks need to be accomplished by the team before they enter the building. Radio communications should be established with the fire fighter in trouble, if possible. Information regarding the location, type of situation, extent of injury or entrapment and the amount of air available in their SCBA will allow the team to prepare for the task ahead of them. Care must be taken to select the minimum amount of tools and

equipment needed to accomplish the rescue so as not to slow down the team in their search and rescue effort. A thermal imaging camera can aid the RIT during a search in a smoky environment and allow quicker access to the downed fire fighter (Crawford, 1999).

At the time the call is made for a lost or trapped fire fighter the RIT needs to be immediately sent to the victim's location (Olson, 1998). A plan of attack needs to be devised between team members before entry is made into the building (Crawford, 1999). The best entry point, for the rescue, needs to be determined by the RIT before haphazardly entering a building. This will help to accomplish a safe and speedy recovery. A search rope should be used from the point of entry to allow the team to go directly to the sound of a PASS devise or to enable the team to find its way back. The search rope also allows for additional team members to be deployed to the rescue area when supplying relief or additional equipment and tools (Crawford, 1999).

Tools Needed for a Rapid Intervention Team

A RIT must be on the fire scene equipped and ready to go to work at all working fires. Each member of the team should report to the I.C. and have in his or her possession:

1. SCBA with an activated PASS devise
2. A large flash light on a strap
3. Sharp knife
4. Spare SCBA
5. 40' of 3/8'' nylon rope (Norman, Nov. 1997).

This will allow them to go to work immediately, if needed.

Placement of the RIT stagging area will vary by the nature and scope of the incident.

During high rise operations it may be appropriate to stage two floors below the fire floor and in other incidents, they may be stagged at the command post or with operations (Murgallis, 1998). A tool stagging area should be established by first laying a tarpaulin on the ground for tool placement (Crawford, 1998). The following tools and equipment will need to be gathered from the fireground and brought to the tool stagging area:

1. Portable radios for each team member
2. 200' of search rope
3. Forcible entry tools, halligan bar and a flat head axe
4. At least 1 forced entry hydraulic tool
5. Life saving rope and harness
6. Spare SCBA and mask for trapped fire fighter
7. Stokes stretcher and resuscitator
8. Power saw
9. Suitable ladders for the building involved (Norman, Nov. 1997).

Furthermore, a copy of the buildings floor plan along with a chart outlining the location of all companies working in the affected area should be supplied to the team. A hoseline should also be made available for the RIT in case one is needed to conduct a rescue or to protect an area of refuge (Norman, Nov. 1997).

NFPA and OSHA Two-in/Two-out

NFPA 1500 outlines the requirements for rapid intervention for the rescue of fire department members. It requires a fire department to provide personnel for the rescue of fire fighters at an emergency scene (1997, 6-5.1). The team will consist of at least two

members in fully protective gear including SCBA (NFPA, 1997, 6-5.2). The structure of the team should remain flexible allowing the I.C. to determine the need for one or more RITs based on the operations at the emergency scene (NFPA, 1997, 6-5.2).

During the early stages of an incident, the RIT can consist of on scene members performing other duties but, they must be able to redeploy as a RIT (NFPA, 1997, 6-5.4). As the incident expands in size or complexity a RIT needs to become dedicated to the incident (NFPA, 1997, 6-5.5). In addition, whenever members are engaged in an operation that subjects them to immediate danger of injury, at least one RIT should be standing in the ready (NFPA, 1997, 6-5.6).

The IAFC and IAFF distributed a question and answer document to assist members of their associations in the understanding of OSHA's two in/two out regulation.

> The regulation now requires that interior structural fire fighting procedures provide for at least two fire fighters inside the structure. Two fire fighters inside the structure must have direct visual or voice contact between each other and direct, voice or radio contact with the fire fighters outside the structure. This section has been dubbed the fire fighters' "two-in/two-out" regulation. (IAFC/IAFF, 1998, 1).

Both the IAFC and IAFF feel that this standard, with the two-in/two out provision "is one of the most important safety advances for fire fighters in a decade. Too many fire fighters have died because of insufficient accountability and poor communications. The standard addresses both,..."(IAFC/IAFF, 1998, 1).

The OSHA standard applies to 23 states and two territories. Massachusetts is not one of the 23 states (IAFC/IAFF, 1998). Although it is unfortunate that not all fire fighters in the US are covered by this standard the IAFC and IAFF feel the fire service must consider

the two in/two out requirement a minimum standard for fireground safety when fire fighters are operating in SCBA whether you work in an OSHA State or not. (IAFC/IAFF, 1998).

OSHA's Respiratory Protection Standard, 29 CFR 1910.134 was developed with private industry in mind rather than the fire service. The two in/twoout (which deals with interior structural fire fighting) in a very small part of the standard, approximately 150 words out of the 18,000 word document (Dalbey, 1999).

The two in/two out section of the regulation goes into effect when fire fighters perform interior structural fire fighting in atmospheres that are "immediately dangerous to life and health" commonly referred to as IDLH atmospheres (Dalbey, 1999).

In a question and answer memo, dated August 3, 1998 and written by John B. Miles, Director of Compliance Programs for OSHA, fire in the advance stages of burning will be producing large amounts of toxic gases and should be considered to be IDLH atmospheres. Only fires that are in their incipient stages can be considered below the IDLH. Miles defines these fires as fires that can be extinguished with small handlines or portable extinguishers and do not require the fire fighters to wear protective gear (Dalbey, 1999).

The standard requires that when fire fighters begin interior fire fighting in IDLH atmospheres they must enter the building in pairs and remain in visual or voice contact with each other at all times. During the time they are in the building at least two fire fighters must be located outside the IDLH ready to rescue the fire fighters inside (Dalbey, 1999). One member of the outside team's only function is to account for the inside team by remaining in visual or voice contact with the inside crew (Dalbey, 1999). The other

member of the outside team can be assigned to tasks that are not critical to the safety and health of those operating on the fireground. This person must also be immediately available to team up with the other member of the outside team and perform a rescue (Dalbey, 1999). OSHA requires notification of the I.C. before a rescue of any fire fighter in the IDLH atmosphere can be started (IAFC/IAFF, 1998). Deviation from the two in/two out standard is permitted only when a known life hazard situation exists and that with immediate action the loss of a life can be adverted (IAFC/IAFF, 1998).

In order for a fire department to comply with the regulation it must develop and implement standard operating procedures. In addition, department training programs must train their personnel in the two in/two out procedures along with its use on the fireground (IAFC/IAFF, 1998).

Chief Steve Dalbey of the Muscature, Iowa, Fire Department offers the following steps to reach compliance with the standard:

The interior team must not enter the IDLH atmosphere before the outside team is in place. The only exception to this rule is when an immediate life threatening situation exists. The interior team must remain together while in the IDLH (1999).

The outside team must monitor the inside teams activity. Chief Dalbey feels that the interior team also should be 50% responsible for maintaining contact with the outside team (1999). Furthermore, when a rescue must be initiated the outside team needs to notify the I.C. so that tactical changes in operations can be made to accomplish the rescue (Dalbey, 1999).

Dalbey feels the greatest challenge will not be assigning members to a RIT but

instead instilling a new relationship with the fire fighters at the fire scene. Especially between the two in and the two out teams and the maintenance of the lines of visual contact and/or communications (1999).

PROCEDURES

Historical research procedures were used in preparing this paper in that it consisted of a literature review of historical data. The research was started in March of 1999 at the National Fire Academy, Learning Resource Center (L.R.C.). A search of articles pertaining to RITs, OSHA's respirator standard 29 CFR 1910.134, NFPA 1500 and two in/two out were searched for by using the LRC computerized card catalog system. All subjects searched were post 1996. Many articles that pertained to these subjects were located during the search.

A majority of these articles were in my personal library including those in *Firehouse*, *Fire Engineering*, and *Fire Chief*. The articles that I knew I did not have access to back in my office were copied by the author at the LRC. The text book, *NFPA 1500*, and 29 CFD 1910.134 were in my personal library and used to a great extent. The gathering of this information proved to be very valuable in the research.

The research began with a thorough review of all the literature collected. This was done to help make the author more knowledgeable about the subject. Articles were outlined to highlight the information that was directly related to this purpose of the research paper. The purpose of this research is to develop a policy to assign personnel during

emergency incidents for the sole purpose of rescuing a fire fighter in trouble and to develop a RIT equipment list. After a thorough review of the literature was completed, the research was action oriented in that a SOP for the use of RITs on the fireground (see Appendix A) and an equipment list (see Appendix B) was developed.

Limitations

The research and analyses were limited to the articles and text reviewed by the author, and the six month time limit for the completion and submission of paper by the National Fire Academy. In addition, because the use of RITs is a relatively new fireground procedure and because Massachusetts in not legally required to follow the two in/two out provision mandated by OSHA, statistical data and the lack of local SOPs or guidelines for review also proved to be a limiting factor.

Assumptions

The procedures used to complete this research paper were based on the assumption that the literature reviewed was factual, objective and unbiased.

Definition of Terms:

CFR. "Code of Federal Regulations." A collection of regulations established by federal laws.

Command Post. A location from which all incident operations are directed and planning functions are performed.

Engine Company. A group of fire fighters whose primary job is to apply water to a fire.

Fire Service. A term used to denote all types of fire control organizations which take direct action to extinguish fires.

I.A.F.C. "International Association of Fire Chiefs." An organization of Chief Fire Officers with the purpose to further the professional advancement of the fire service.

I.A.F.F. "International Association of Fire Fighters." A labor organization representing full time paid Fire Fighters.

I.C. "Incident Commander." The person responsible for all decisions relating to the management of the incident.

I.C.S. "Incident Command System." An organized system of roles, responsibilities and standard operating procedures used to manage and direct emergency operations.

IDLH. "Immediately Dangerous to Life and Health." Any atmosphere that poses an immediate hazard to life or produces immediate irreversible, debilitating effects on health. IDLH concentrations represent concentrations above which respiratory protection is required.

Mutual Aid. A formal agreement of assistance from surrounding fire agencies.

NFPA. "National Fire Protection Association." An international voluntary membership organization which promotes improved fire protection and prevention, establishes safeguards against loss of life and property by fire, and writes and publishes the National Fire Standards.

OSHA. "Occupational Safety and Health Administration." Branch of the U.S. Department of Labor. An agency with safety and health regulatory and enforcement

authorities for most U.S. industries, business and states.

RIT. "Rapid Intervention Team." A team of fire fighters assigned for the sole purpose of rescuing fire fighters working at emergency incidents.

SCBA. "Self-Contained Breathing Apparatus." A positive pressure, self-contained breathing apparatus.

Staging Area. The safe area established for temporary location of available resources closer to the incident site to reduce response time.

RESULTS

1. What is required in NFPA 1500 concerning rapid intervention for rescue of department members?

NFPA 1500 (1997) 6-5 Rapid Intervention for Rescue of Members covers the NFPA standard for Rapid Intervention Teams (RIT), although they refer to RITs as Rapid Intervention Crews (RIC). First the standard states the fire department shall provide personnel to rescue fire fighters working at an emergency scene (1997, 6-5.1). The team will be made up of at least two members fully equipped and protected with appropriate protective clothing including SCBA. These team members must be available for the rescue of fire fighters in need (1997, 6-5.2).

NFPA 1500 6-5.3 allows the composition and structure of the team to remain

flexible to enable the I.C. to first evaluate the emergency scene and then decide the make-up and number of teams needed for a given situation (1997). Additionally, the standard views the assignment of the team in two phases. First, during the initial stages of the incident the RIT is allowed to perform other functions on the fireground as long as they are able to leave these functions to perform a rescue. The only restrictions on this is that when they discontinue the assigned function it does not jeopardize the safety of those on the fireground and that they can be deployed immediately (1997, 6.5.4). The second phase goes into effect when the incident expands in complexity or is considered beyond it's initial stages. In these situations a dedicated RIT needs to be assigned and made up from on scene members or companies (1997, 6-5.5).

At least one team needs to be standing by and properly equipped while other department members are performing special operations or are in a position that equipment failure or a collapse could cause immediate danger or injury (1997, 6-5.6). The standard, in section A-6-4.3, invites those looking for additional information to refer to 29 CFR 1910.134 "Response to IDLH or Potential IDLH Atmospheres." (1997). NFPA feels that four (4) fire fighters should be assembled on the fire ground before an interior fire attack should take place. By having a minimum of four (4) fire fighters on scene two (2) fire fighters can be *in* the structure conducting an interior attack, the other two (2) fire fighters are *out* of the structure maintaining the ability to rescue the fire fighters in the structure (NFPA, 1997, A-6-4.4.2). The exception to this rule is when a fire fighter(s) must enter a structure to eliminate a life threatening situation before the arrival of four (4) fire fighters on scene (1997, A-6-4.3).

2. Is there a real need for RITs?

Yes. Fire fighting is still a very dangerous profession by the very nature of the business it engages in seven days a week twenty-four hours a day. Fire fighters are exposed to the greatest risk of death or injury while operating at an emergency scene and will continue to find themselves in life threatening situations because of the unpredictability of the fire and the fire building. (Murgallis, 1998). Hal Bruno, in a February 1998 article in *Firehouse* magazine, stated that OSHA's new rule dealing with two in/ two out is a direct result of fire fighters being killed in a fire building because a rescue team was not standing by and available when they needed help. Trying to gather a rescue team together, after the fact, is inefficient and wastes much, if not all, the valuable time it takes to perform a successful rescue (Crawford, 1999).

OSHA apparently felt that RITs were essential elements to the safety of those operating on the fireground because they developed a federal regulation, 29 CFR 1920.134, requiring the establishment of RITs at emergency scenes in the 23 states and two territories that they have legal authority over. Furthermore, the NFPA has established a standard requiring fire departments to have a means to rescue fire fighters when the need arises. This standard is modeled very closely to the one established by OSHA.

The I.C. has many responsibilities during fireground operations. In order to devote the appropriate attention to those operating inside a fire building it would be prudent for the I.C. to assign a dedicated team that can devote the required attention to them. By establishing a dedicated team to both monitor and be in the ready to rescue any of those that may be in trouble will provide those operating on the fire scene a level of safety they

both deserve and in my opinion are entitled too.

3. How can RITs be integrated into the Chelmsford Fire Department?

RITs can be integrated into the Chelmsford Fire Department by adopting the standards set forth in NFPA 1500. A SOP (Appendix A) has been developed to establish the appropriate policies and to ensure that the desired intent of the RITs are initiated during emergency operations when appropriate. Training of the entire department will also be conducted to ensure that RIT members are capable of performing the required functions expected of the team. An equipment list has been established (Appendix B) along with a checklist (Appendix C) to aid the team in their set up and operation.

The initial requirement of the RIT will follow the guidelines requiring four (4) fire fighters on the fireground before interior operation can start unless a life threatening situation exists. A dedicated team will be established on all working fires by dispatching an additional engine company to the scene. This company will be assigned as the dedicated RIT for the incident. The I.C.S. will be modified to include the RIT in the I.C. initial strategies and tactics. As always, each emergency operation will be critiqued to ensure, among other things, that the RIT is functioning as designed and producing the desired results.

4. What changes will need to be made in the current response system's running cards?

The only changes required to the current response system will be to move up an additional engine company on working fire assignment. This engine company move up will create the need to also move mutual aid companies up by one engine on multiple alarms

(see Appendix D).

5. Will there be an additional cost to the department for the implementation of a RIT?

No. Based on the fact that we operate five engine companies and only utilize three on a working fire the additional engine company would be provided by the duty crew assigned that day. There will be an additional burden placed on the mutual aid system but, in conversation with surrounding departments it is felt that the additional use of the system will be minimal for our area and call rate.

Although there will not be an additional cost to the department, there very well could be a hidden savings. Being able to provide immediate help to a lost or trapped fire fighter could reduce or eliminate the extent of injuries received by the fire fighter during a mishap. Work related injuries and time off the job because of these injuries are very costly to the department. In addition, there is always the possibility of a fire fighter or his/her family to hold CFD legally responsible for not having the proper policies in place to rescue a lost or trapped fire fighter as described by NFPA or legally required by OSHA in 23 states and two territories.

DISCUSSION

The study conducted in this research paper has shown the author that there is much more to RITs than having two fire fighters outside the fire building waiting to rescue those working inside the building. Training department members in RIT responsibilities, basic

survival skills on the fireground, the RIT concept and the related standard operating polices are all interrelated when attempting to provide a successful rapid intervention program.

Robert Cobb believes one of the reasons fire fighters are being injured and killed during the initial stages of a fire are because of building construction features and the lack of fire fighter survival training (1998). Fire fighters need to improve their awareness of the hazards that are present on the fireground in a given situation (Norman, July, 1997). Many times, fire fighters become so involved in *"putting the wet stuff on the red stuff"* they do not take the time to properly size up the fireground and recognize the potential dangers that face them. In addition, they seem to attack each fire with the same vengeance no matter what the life hazard or occupancy. Fire fighters will typically fight a fire in an occupied residential home at 2:00 AM as they would fight a fire in an unoccupied commercial building at the same time of day. Clearly this practice should change. Fire fighters need to limit the amount of times they put themselves in harms way, based on the life hazard and occupancy.

A size-up of a structure needs to be conducted before entry is made into the building. By making mental notes of where the windows and other means of egress are before entering a building the fire fighters can have an escape plan in the back of their mind, in case they become lost or trapped. Being able to extricate oneself from a building is a very important survival skill (Norman, July, 1997). These skills need to be taught to our department in order that they mat be translated to safety on the fireground.

The RIT concept is more than having two (2) outside a building while two (2) men are inside or as simple as having four (4) fire fighters on the fireground before an interior

attack can be conducted. RITs need to have special training in the art of rescuing a fire fighter in need, conducting building size-ups, proper use of rescue tools and a strong knowledge of the department policies on rapid intervention (Lasky, 1997). Additionally, RITs need to become an integral part of the I.C. tactic and strategies when operating at emergency scenes with IDLH atmospheres (Cobb, 1998). Integration of RIT training into the department training program, strong RIT SOPs and policies, an established RIT equipment list and a RIT checklist will ensure that the RIT concept is ingrained into the department philosophy.

Both NFPA 1500, section 6-5, rapid intervention for rescue of members and OSHA's 1910.134, dealing with the 2 in/two out rule, call for the need of RITs on the fireground. I do not believe that anyone would argue that fire fighting in still a very dangerous job and that fire fighters will be injured and killed each year because they become lost or trapped while conducting interior operations. Both the IAFC and the IAFF are recommending that OSHA's two in/two out requirements become the minimum standard on the fireground when fire fighters are operating in SCBA.

The information and knowledge gained through the literature review has convinced the author that the use of RITs and the two in/two out concept should be adopted as a minimum standard by the Chelmsford Fire Department. Even though Massachusetts is not an OSHA state, and therefore is not obligated by law to establish this minimum requirement, I feel the standard has been set across the nation and morally and ethically we owe this measure of safety to our membership.

RECOMMENDATIONS

After the completion of the research, I feel the Chelmsford Fire Department should adopt the RIT concept as outlined in *NFPA 1500*, section 6-5 *"Rapid Intervention for Rescue of Department Members."* This conclusion has been reached because of the benefit it will provide the department and it's membership. The use of the RIT on the fireground will greatly enhance the department's ability to rescue lost or trapped fire fighters and in turn will provide a higher level of safety for those operating at an emergency scene.

The use of RITs are a fairly new concept and has come to the forefront only since OSHA required them in 1998. Because of this, many of the models for RITs are new and untested. However, the literature review has provided the author with the needed information to implement a RIT program to meet the desired purpose of this research project. This program will provide for the rescuing of fire fighters, while working at a fire scene that find themselves in trouble, for whatever the reason.

A SOP has been developed (Appendix A) for the future use of this department. It clearly outlines the responsibility of the RIT and how the RIT concept will work on the fireground. The equipment list (Appendix B) clearly states what equipment needs to be made available for the operation of the team. Based on additional information gained in the literature review the author has come to the conclusion that a RIT checklist also needs to be developed to ensure the full benefit of the program. Therefore, a checklist developed by Kolomay and Hoff, *"Saving Our Own: The Rapid Intervention Team*

Checklist" published in *Fire Engineering* (Appendix C) has been adopted by the Chelmsford Fire Department and will become an important part of the over all program (1998). The running cards will also be adjusted to assign a dedicated RIT on all fires or emergency calls at or above a working fire assignment (Appendix D).

The most important part of the entire program will be the training that the department will receive related to the RIT concept. The department will develop a program to train fire fighters in the skills they will need to rescue fire fighters lost or trapped at an emergency scene. The training program will encompass search and rescue techniques, familiarization and use of the tools assigned to the team, the integration of the RIT concept into the ICS and a thorough review of the SOP, including the equipment list and RIT checklist. Additional training will be conducted on fire fighter survival skills on the fireground. The need for this type of training became very apparent during the literature review process.

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APPENDIX A

RAPID INTERVENTION TEAM S.O.P.

RAPID INTERVENTION TEAM S.O.P. - 9/01/99

GOAL:

To increase the overall level of safety for department members operating at emergency incidents. This S.O.P. should be integrated into procedures that are already in effect.

RESPONSIBILITY:

1. It shall be the responsibility of each member of the Chelmsford Fire Department to utilize the RIT concept when operating in IDLH atmospheres.
2. It shall be the responsibility of all officers or senior company fire fighters to initiate the I.C.S., the Accountability System and to utilize the RIT concept as outlined in this S.O.P.

PROCEDURES FOR RAPID INTERVENTION TEAMS:

Initial Response:

1. RITs will be established when companies are engaged in active fire fighting activities or at incidents that fire fighters are subjected to work in IDLH atmospheres.
2. Fire fighters operating in IDLH atmosphere must work in teams and remain in visual or voice contact with each other.
3. Anytime fire fighters are in IDLH atmospheres a RIT must be located outside the IDLH ready to rescue the fire fighters inside. The only deviation to this rule is when a known life hazard exists and that without immediate intervention a loss of life will occur.
4. RITs will consist of a minimum of two fire fighters in full protective gear, including SCBA.

5. At least one member of the RIT must remain in contact with members operating in the IDLH.

6. During the initial stages of an incident RIT members may be involved in other duties such as flaking hose, ground level ventilation or assisting the I.C., as long as these duties do not inhibit their ability to perform RIT functions.

Dedicated RIT:

1. All incidents of a working fire or above will have at least one RIT dedicated to the emergency scene. This will be accomplished by dispatching an additional engine company to become the dedicated RIT. This engine will be preassigned and automatically dispatched.

2. RITs will consist of a minimum of two fire fighters in full protective gear including SCBA and the necessary equipment needed to operate (see attached equipment list).

3. The dedicated RIT will complete the RIT check list (see attacked check list) upon arrival and not be given additional duties other than to assist those operating in IDLH atmospheres in the event they are lost, trapped or reported missing.

4. The dedicated RIT will establish a staging area for themselves and their equipment.

5. The RIT will remain in place until all companies are free from operating in IDLH atmospheres and the risk of collapse has past.

APPENDIX B

RIT EQUIPMENT LIST

Each member of the RIT should report to the I.C. and have in his or her possession the following equipment:

1. SCBA with an activated PASS devise
2. A large flash light on a strap
3. Sharp knife
4. Spare SCBA
5. 40' of 3/8" nylon rope.

A RIT stagging area should be established and a tarpaulin placed on the ground for tool placement. The following tools and equipment will need to be gathered from the fireground and brought to the tool stagging area:

1. Portable radios for each team member
2. 200' of search rope
3. Forcible entry tools, halligan bar and a flat head axe
4. At least 1 forced entry hydraulic tool
5. Life saving rope and harness
6. Spare SCBA and mask for trapped fire fighter
7. Stokes stretcher and resuscitator
8. Power saw
9. Suitable ladders for the building involved

In addition a hoseline should be available in the event one is needed to accomplish a rescue or provide protection for the RIT and the victim.

APPENDIX C

RAPID INTERVENTION TEAM CHECKLIST

SIZE-UP

___ 1. Building size up (length X width X height).

___ 2. Building occupancy.

___ 3. Building construction type:

- ___ Wood frame.
- ___ Heavy timber.
- ___ Ordinary.
- ___ Noncombustible.
- ___ Fire restive.

___ 4. Placement of windows, doors, fire escapes, porches, etc.

___ 5. Potential danger of high-security doors, barred windows, building modifications.

TACTICS

___ 6. Offensive, defensive, defensive-to-offensive.

___ 7. Command operations:

- ___ Check tactics board.
- ___ Check accountability system.
- ___ Communications/incident commanders.

___ 8. Ladders and truck operations.

___ 9. Fireground time vs. progress.

EQUIPMENT

___ 10. Place equipment in staging area (see RIT equipment list).

OTHER OPERATIONS

___ 11. Check with safety/compare information.

___ 12. Potential collapse and collapse area.

___ 13. Relocate or add more RIT.

___ 14. Location of EMS unit.

Source: Kolomay, R. & Hoff, B. (1998, January). Saving Our Own: The Rapid Intervention Team Checklist. *Fire Engineering*, 12.

APPENDIX D

INCIDENT RUNNING CARDS

```
CHE   FM.RUN              CHELMSFORD FIRE DEPARTMENT       09/13/99 13:58   PAGE 1
      v5.5a               RUN CARD   ... BOX# 1291

                                                         -----------hydrants---------
  M/S BOX: 1291         id#:   11749 wrn:              | 1 SMITH ST                  C9
 box desc: PHANTOM BOX FOR ACADEMY ST                  | 27 LOVETT LN                C6
  address: 0 ACADEMY ST                                |
     name: DIRECTIONS - SEE COMMENTS                   |
occupancy:                                             |
    inter: NORTH RD                                    |
telephone:                      geo cd: 10             |

 comments:

    <...to fire..................>|<engines..cover assignments....ladders>
al# <...engines........> <ladders>|
1ST E1     E3    R1           L1  |
WF  E5                            |E4    TO    E1
2ND E4     E2                     |LOW   BIL                         LOW

ln# ---location unique running card-----------------------------------------
001 FROM 7 NORTH RD TO 4 WESTFORD ST
```

```
CHE   FM.RUN              CHELMSFORD FIRE DEPARTMENT       09/13/99 14:54   PAGE
      v5.5a               RUN CARD   ... BOX# 1291

                                                         -----------hydrants--------
  M/S BOX: 1291         id#:   11749 wrn:              | 1 SMITH ST                  C
 box desc: PHANTOM BOX FOR ACADEMY ST                  | 27 LOVETT LN                C
  address: 0 ACADEMY ST                                |
     name: DIRECTIONS - SEE COMMENTS                   |
occupancy:                                             |
    inter: NORTH RD                                    |
telephone:                      geo cd: 10             |

 comments:

    <...to fire..................>|<engines..cover assignments....ladders>
al# <...engines........> <ladders>|
1ST E1     E3    R1           L1  |
WF  E5     RIT   E4               |BIL   TO    E1
2ND E2     BIL                    |LOW   TEW                         LOW

ln# ---location unique running card-----------------------------------------
001 FROM 7 NORTH RD TO 4 WESTFORD ST
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